Original Research Article

HAEMATO-BIOCHEMICAL PROFILE AND PREVALENCE OF GASTROINTESTINAL PARASITISM IN MIGRATORY GADDI GOATS OF HIMACHAL PRADESH

ABSTRACT

Study conducted on migratory goats in mid-hills around Palampur revealed high prevalence of gastro-intestinal parasitism (Strongyle, Trichuris and Monezia) with mean EPG value of 1656±136.40 in 30 goats out of the total 40 included in this study. Flotation method of faecal examination revealed greater incidence of GIT parasitism. There was significant reduction in TEC, Hb, PCV and MCV in infected goats as compared to healthy goats. Mean values of calcium, albumin, globulin, magnesium and iron were also found to be significantly decreased statistically in infected group. Considering the high parasitic load during migration regular deworming of the migratory goats is advised to keep them healthy and in good body condition.

Conclusion: Present study concluded that prevalence of GIT parasitism in migratory flock of goat was high when assessed at mid-hills altitude with various haematological and biochemical parameters below the normal range as compared to healthy animals. Considering the high parasitic load during migration regular deworming of the migratory goats is advised to keep them healthy and in good body condition.

Keywords: ***Migratory; Gaddi; Goats; Parasitism; Haemato-biochemical;***

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1. INTRODUCTION

India is predominantly an agricultural country and animal husbandry is an integral part of its economy. Himachal Pradesh too has about 90 per cent population that lives in rural areas (2011 census) and dependency on Agriculture/ Horticulture/ Animal Husbandry provides employment to the rural inhabitants. Goat rearing is a traditional occupation of the nomadic tribes in Himachal Pradesh. Migration is practiced since ancient times by the people living in mountain locked backward and tribal areas to find better fodder for their flocks. The traditional goat rearers are known as “Gaddis” and are semi-nomadic tribal Hindu group who practice long distance herding of sheep and goats from range to range and their flocks are migratory in nature through well-defined routes in Himalaya including alpine pastures. These animals remain confined to the pastures of low plains of Himachal Pradesh during the winter season, but migrate to the alpine pastures during spring and summer seasons meeting the purpose behind small animal farming *i.e.* low investment and good output helping in sustaining the poor farmer’s family. Small ruminants especially in hilly areas are often prone to infection with parasites. Parasitic diseases have a special significance as they cause significant morbidity and economic losses due to reduced wool, meat and milk output; slowed growth, illness, and mortality. Therefore, present investigation was planned to study the effect of gastrointestinal (GIT) parasitism on haematological and biochemical profile in migratory goats.

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2. MATERIAL AND METHODS

The study was conducted on a total of 40 Gaddi goats, aged above 1.5 years, out of the total 250 goats from the migratory flock belonging to Sh. Gheller Ram of village Chowki Khalet P.O. Thakurdwara Teh. Palampur temporarily stationed at old Vindhyavasini location near Palampur (approx. 1350 m above mean sea level) in sub humid mid-hills zone. These goats included 10 goats found apparently healthy on clinical examination. The migratory route practised by the flock is given below:

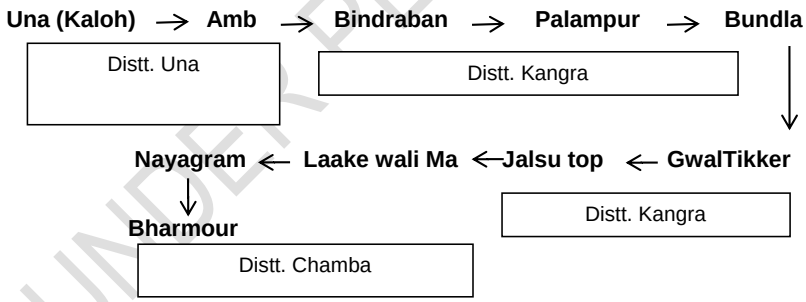

Chart 1. Migratory route practised by the flock

Collection and analysis of faecal and blood samples

Faecal samples from migratory goat flock were collected and screened for the presence of eggs of the gastrointestinal parasites. Five grams of faecal sample was collected directly from the rectum of each goat in a clean polythene bag. The faecal samples were analysed by Direct Smear Method and Floatation Technique for detecting eggs of GIT Parasites. The samples found positive for eggs were further subjected to assessment of Eggs per gram (EPG), as per procedure advocated by Gupta and Singla (2012).

About 2 mL of blood was collected from the jugular vein in sterile vials containing EDTA for complete blood count (CBC). Another 5 mL blood was collected in heparinized syringe for plasma separation. Plasma was separated by centrifugation at 3000 rpm for 10 minutes and these plasma samples were preserved at -20°C in a deep freezer for further biochemical and mineral estimations.

Evaluation of haemato-biochemical parameters

The haematological parameters were studied using an Auto-Haematology Analyser BC-2800 Vet (Manufactured by Mindray Medical International Limited, Shenzhen-China; Marketed by Fresenius Medical Care Private Limited, New Delhi). Parameters assessed were Haemoglobin (Hb) (g%), Packed cell volume (PCV) (%), Total erythrocyte count (TEC) ($x10^{12}$/L), Total leucocyte count (TLC) ($x10^{9}$/L), Mean corpuscular volume (MCV) (fL), Mean corpuscular haemoglobin (MCH) (pg) and mean corpuscular haemoglobin concentration (MCHC) (%). Biochemical parameters studied were glucose (mg%), total serum protein (TSP) (g/dL), albumin (g/dL), globulin (g/dL), Calcium (mg/dL), Phosphorus (mg/dL), Iron (µg/mL) and Magnesium (mg/dL) using commercial reagent kits, based on spectrophotometric methods, through semi-automatic biochemical analyser Microlab 300 Clinical Chemistry Analyser (by Merck Limited, Mumbai). The results were compared with values obtained from healthy control. Data collected, was analysed statistically employing “t test” InStat software. Ten apparently healthy goats were selected as healthy group from the same flock. Only those goats were selected as healthy control in which EPG value was less than 500.

3. RESULTS AND DISCUSSION

30 goats were found positive for git parasitism and constituted infected group in present study. All of them had epg above 1200. Prevalence of git parasites was found to be 86.6% (26/30)
on direct smear examination and 93.33% (28/30) on floatation method (table 1). Different types of eggs found were Strongyle, Trichuris and Monezia.

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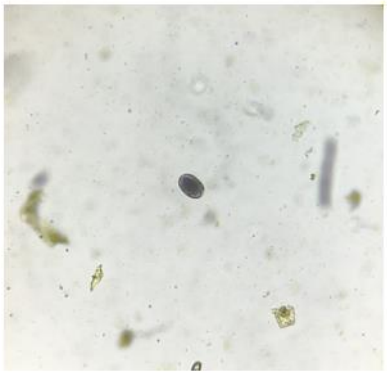
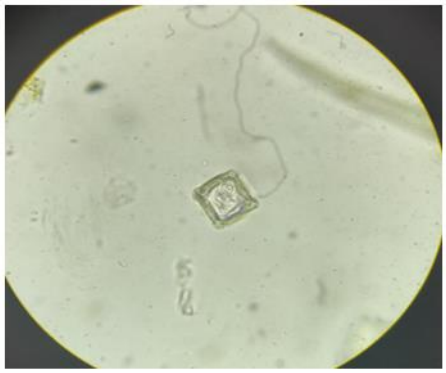
FIG. 1 Site of Sampling

FIG.2COLLECTION OF SAMPLES





Strongyle egg Monezia egg

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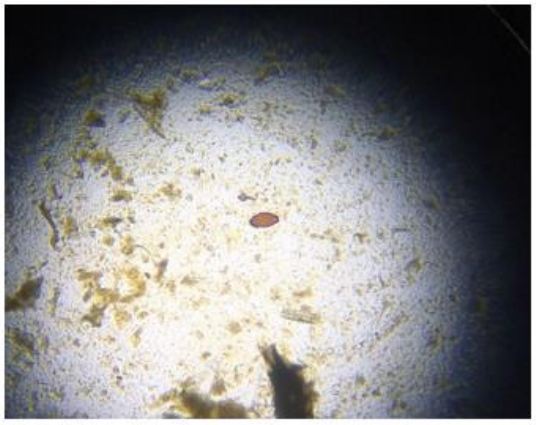

Trichuris egg

Fig. 3 Eggs of different endoparasite found

Table 1. Observation On Faecal Examination In Infected Group

Total Samples In Infected Group	% Incidence On Direct Smear Method	% Incidence On Flotation Method	Types Of Parasites Found	Mean EPG
30	86.6% (26/30)	93.33% (28/30)	Strongyle, Trichuris and Monezia	1656±136.40

Mean epg value was found to be 1656±136.40 as compared to 370.82±92.08 of healthy control. There was significant reduction in TEC, Hb, PCV and MCV in infected goats as compared to healthy goats (table 2).

TABLE 2. Haematological Profile of Goats Infected with Gastrointestinal Parasitism And Apparently Healthy Goats.

Sr. No	Parameters	Infected Goats (N=30)	Healthy Goats (N=10)
		Mean ±Se	Mean ±Se
1	Tlc (10^9/L)	12.98±0.89	12.11± 1.030
2	Tec (10^{12} /L)	14.77±0.46**	16.63± 0.25**
3	Hb (G/Dl)	6.40±0.22***	9.18 ±0.25***
4	Pcv (%)	24.40±0.91***	32.72 ±0.88***
5	Mean Corpuscular Volume (fl)	16.55±0.27***	21.19 ±0.45***
6	Mean Corpuscular Haemoglobin (pg)	4.78±0.16	4.93 ± 0.04
7	Mean Corpuscular Haemoglobin Concentration (g/dl)	28.49±1.06	29.90± 0.28

*Significant At 5% Level (P<0.05) **Significant At 1% Level (P<0.01) ***Significant At 0.1% Level (P<0.001)

The reduction in PCV, Hb and total erythrocyte may be due to acute loss of blood by sucking activity and haemorrhages caused by various parasites (bhat *et al.* 2004 and amulya *et al.* 2014). The decreased level of Hb and Pcv during gastro-intestinal nematode infection in goats has also been reported by pal *et al.* (2001), rajguru *et al.* (2002) and kar *et al.* (2007). The gastro-intestinal nematodes and cestodes infection has been reported to affect the

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normal digestion and assimilation in small intestine (lakra *et* al. 2007). Mean values of calcium, albumin, globulin, magnesium and iron were found to be significantly decreased statistically in infected group when compared to healthy group (table 3).

table 3. Biochemical Profile Of Goats Infected With Gastrointestinal Parasitism And Apparently Healthy Goats.

Sr. No	Parameters	Infected Goats(N=30)	Healthy Goats(N=10)
		Mean ±SE	Mean ±SE
1	Calcium (mg/dl)	7.86±0.26*	8.92 ± 0.41*
2	Phosphorus (mg/dl)	3.43±0.26	4.13±0.28
3	Albumin (g/dl)	3.28±0.15**	4.15 ± 0.23**
4	Globulin(g/dl)	2.98±0.16***	3.75±0.20***
5	Total Protein (g%	6.26±0.31	7. 90± 0.43
6	Iron (µg/ml)	1.45±0.41*	2.63 ± 0.23*
7	Magnesium (mg/dl)	2.6±0.06***	3.25 ± 0.04***
8	Glucose (mg%)	52.20+1.67	53.31 + 1.90

*significant at 5% level (p<0.05) **significant at 1% level (p<0.01) ***significant at 0.1% level (p<0.001)

The hypoproteinemia and hypoalbuminemia in the affected animals could be attributed to protein losing gastroenteropathy in nematodiasis (soulsby, 1982) and malabsorption of proteins from damaged intestinal mucosa in concurrent gastrointestinal infections (ahmed *et al.* 2015). The phosphorus and glucose level did not differ significantly.

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4. CONCLUSION

Present study concluded that prevalence of GIT parasitism in migratory flock of goat was high when assessed at mid-hills altitude with various haematological and biochemical parameters below the normal range as compared to healthy animals. Considering the high parasitic load during migration regular deworming of the migratory goats is advised to keep them healthy and in good body condition.

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